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## THE UNSEEN REGIONS OF A THEATRE.

THAT part of a theatre which is concealed from the view of the audience is always a subject of interest and speculation to the uninitiated, and most playgoers experience a desire to explore the mysterious region. When, therefore, some years ago, an opportunity presented itself to me of gratifying my curiosity in this respect, I did not fail to take advantage of it. Since then, I have been behind the scenes of various theatres, and my experience has convinced me that the public is not aware how small a portion of the house behind the curtain is exposed to the view of the audience, the regions both above and below the stage being more extensive than is usually imagined. Indeed, when, several years ago, the Opera House in Paris was burned, it was with surprise that the public learned from the newspapers that the edifice had no fewer than four separate underground floors.

At the present day, in most first-class theatres in London and New York the subterranean portion of the building consists of at least two or three distinct stories. The fact is, it is now quite impracticable to meet the requirements of a grand spectacular piece without ample space being provided for the scenery underneath the stage. Many, too, of the finest plays are so constructed that several changes of scene are required in every act; and each scene must be a masterpiece of the stage-carpenter's art, to satisfy the exacting demands of a modern audience. The old system, when an alteration of scene was necessary, was primitive enough. In some instances, there descended from the 'flies' a large curtain, on which was painted a landscape, or the interior or exterior of a building, as circumstances might require. In other cases, wooden frames, termed flats, with canvas tightly stretched upon them, were pushed upon the stage from either side, meeting at the centre, and frequently presenting an ugly seam at the place of junction. No little skill was

demanded in handling a huge frame many yards in height and width; for if it once lost its perpendicular, it became unmanageable, and fell—then requiring the exertions of several men to restore it to its proper position. The scenes also had a tendency to stick in the grooves in which they ran, and when this occurred, the disapprobation of the audience was incurred. It is said that a mishap of this kind having once taken place at one of the transpontine theatres, a spectator in the gallery called out: 'We don't look for grammar at this 'ere 'ouse, but we think yer might see that yer "flats" jine properly.'

All this is now altered. At the London theatres of the better class, when a change of scene is requisite, it is effected in a few seconds and in an admirable manner. An extensive landscape, or a lofty battlemented castle—so strongly constructed that it seems as if it were built of solid masonry—or a spacious apartment completely furnished, is, as if by magic, placed before the audience.

It has often struck us that playgoers scarcely adequately realise the extraordinary mechanical ingenuity displayed in the production of many of the pieces of late years presented to the public. Take, for instance, the fairy spectacle entitled *Le Roi Carotte*. In it there was a scene in which an old magician was dismembered in the presence of the audience. The situation was this: an aged sorcerer, in order to be rejuvenated, requests his friends to cut him into pieces and throw him bit by bit into a red-hot oven; after which process he expects to come out a young man. His wishes are complied with; he is put piecemeal into the furnace without his leaving the stage or ceasing to talk. Seated in an armchair, the old man asks that a large volume shall be brought in and laid on a table in front of him. The book, on being placed in the required position, becomes immediately vivified; living gnomes issue from the pictures on its pages and skip about the stage; after which they re-enter the book,

and it is closed and carried away. Then the legs and arms of the magician are cut off and thrown into the furnace; next he is decapitated, and his head is placed on the table, where it continues talking, giving instructions with regard to the trunk. After this the head is cast into the oven, which bursts open with a loud report, and a young and handsome man comes out of it.

The transformation is so ingeniously effected that the manner in which it is executed is incomprehensible to the ordinary spectator. This is the way in which the feat is accomplished: when the volume is placed on the table, the sorcerer, seated in the armchair, quietly withdraws his legs from sight, placing them on a trap beneath the level of the stage; at the same time he slips his arms under his loose gown, *papier-mâché* limbs being substituted in both instances for the real ones. This is done whilst the attention of the audience is diverted to the book and its animated pictures, which are little boys who come up from underneath the stage, through holes in the table and book, which is furnished with india-rubber springs, which close directly the gnomes have emerged from the volume. After the magician's legs and arms have been taken off and thrown into the fire, nothing is left but his trunk and his head. The latter is a mask which fits the actor's face, leaving nothing visible but his lips and eyes. One of the persons on the stage tugs at the magician's head until he pulls it off—that is to say, he removes the mask. As this is being done, the sorcerer has sunk down a trap, and he rises again through the table. The performer, with his head inserted in the mask, continues to talk, giving instructions with respect to the disposition of the trunk, which remains in the chair. Finally, the artificial head and the trunk, which are also of *papier-mâché*, are thrown into the furnace. The magician in the meanwhile has reascended by means of another trap farther back, slipping on a rich dress on the way; and when the oven bursts, the old man steps forth rejuvenated.

The reader must now see what skill and ingenuity the feat demands—what careful attention to every detail, what precautions against the slightest error, what rapidity in working of the traps, and what accuracy of movement on the part of the actor who plays the old magician. But, indeed, the skill and dexterity demanded of those to whom are intrusted the mechanical arrangements of some pieces, are far greater than are supposed by the public, who content themselves with admiring the results, without reflecting upon the care and labour they have involved.

In an opera called *Les Amours du Diable*, produced in Paris some years ago, there was a curious scene which puzzled all who saw it. A slight palanquin—constructed in such a manner that it was obvious that there was no possibility of its having a double bottom—was brought upon the stage supported on the shoulders of slaves. The actress, who occupied it, withdrew the curtains and gave some orders to her attendants. Then the curtains were closed for an instant, and again re-opened. But the occupant of the palanquin had disappeared.

What had become of her? The feat had been executed close to the front of the stage, and under a brilliant light; and the spectators could plainly see that it was certain that the lady had not gone down a trap. The mystery remained for some time unsolved. The explanation of the puzzle was simply this: the pillars of the palanquin appeared to be very slight, but instead of being wood, they were hollow metal tubes. Through these tubes, ropes ran on pulleys at the top of the palanquin, descending in the inside, and fastened to the frame, on which was placed the silk cushion on which the actress reclined. To the other end of the ropes was attached a heavy weight which exactly balanced that of the lady. One of the slaves was impersonated by an expert machinist. So soon as the curtains were drawn, he pulled a cord which released the counterpoise, and the frame, together with its burden, rose to the dome of the palanquin. There the actress lay quite comfortably, a wire-guaze overhead enabling her to breathe freely. Pains had been taken in the constructing of the palanquin to make it appear frail, whilst in reality it was very strongly built, that the roof might bear the strain upon it of the weight it had to support. The bearers were men selected for their muscular strength, and they were drilled in the practice of taking up the palanquin—after the disappearance of its occupant—and carrying it off the stage at a sharp trot, as if they were empty.

Of recent years, great improvements have been made upon the old plan of representing the motion of the waves in a sea-scene. When, some years ago, a comedy called *Surf, or Summer Scenes at Long Branch*, was brought out at the Arch Street Theatre in Philadelphia, there was a scene in which the heavings of the ocean and the breaking of the waves upon the shore were imitated with excellent effect. Miss Logan, the authoress of the play, has described the ingenious mechanical appliances that were made use of on the occasion; she says: 'There was a large cylinder, reaching across the stage from wing to wing on either side, and garnished with curling stiffened canvas, running around the cylinder after the fashion of the threads of a screw. This was put in revolution by means of a crank at the end, which was turned by a man behind the wing. The curling canvas was painted to represent the foamy surf. Behind the first cylinder were two others of similar character which revolved in like manner. When the three were in motion together, with a peculiar arrangement of light and shade upon them, the effect was strikingly like the rolling in of the waves upon the beach. There were various other appliances employed to heighten the illusion, such as a large box of pebbles tilted to and fro behind the scenes in a manner to closely imitate the sound of the waves; a gauzy painted cloth worked up and down an inclined plane, and represented the thin wave that rushes up the sands and retires again; rows of broom-corn, painted green, simulated the seaweed. The characters of the play, who are supposed to go in bathing at Long Branch dressed in the usual costumes, sprang through openings made of india-rubber—painted like the rest—which closed behind them as water might, could, or should

do; and a little later, the actors, having passed under the stage by means of traps, reappeared at the back of the scene between the revolving cylinders, and jumped up and down, as if disporting themselves in the surf. The scene was very effective, and conducted largely to the success of the play.

Conflagrations on the stage are now so realistic as occasionally to alarm the spectators, who can scarcely believe that some portion of the scenery has not taken fire. But the precautions taken against danger are so thorough that there is no likelihood of an accident happening on these occasions. In a piece entitled *La Madonna des Roses*, which the writer once saw in Paris, there was the best representation on the stage of a conflagration he has ever witnessed. A fire was supposed to break out suddenly in an apartment in a ducal palace. Smoke and flame in a few moments poured forth in volumes from the windows and doors, and extending quickly to the walls, they fell in. They were constructed of two layers of wood, held together by thin cords, passing through holes. At the proper time, certain portions of the scenery were removed, leaving the others apparently burning fiercely—an effect produced by small gas jets arranged in rows around the edges of the frames. Behind the heavy set-piece at the back of the stage was a transparent curtain, on which flames were painted; and when the wall tumbled down, this scene being lit up, glowed with a lurid light in a very natural manner. At the same time, burning naphtha projected sheets of flame four or five yards in height, and large funnels overhead poured out torrents of black smoke mixed with sparks. It was indeed difficult for an audience to realise that the fire was not real, and that the whole of the scenery was not a heaving mass of flame.

In the description of the various mechanical contrivances resorted to in order to produce the scenic effects, the writer has been in some measure indebted to the theatrical reminiscences of Miss Olive Logan, an American actress.

## BY ORDER OF THE LEAGUE.

### CHAPTER XX.—CONCLUSION.

TURNING into Holborn, he ran on blindly, never noticing another figure following in his footsteps. It was getting very late now, and as he hurried into the Strand, St Clement's Danes struck midnight. Through the crowd there blindly, on to the water-side, the snaky figure close behind never off his track; on to the Embankment, and towards Waterloo Bridge. Then he stopped for one brief moment to regain his spent breath and think.

The following footsteps halted too; and then some instinct told him he was followed. Turning round again, full under the lamplight, he encountered Paulo Salvarini, determination in his face, murder in his eyes. In an agony of sudden fear, Le Gautier ran down the steps on to the Temple Pier, standing there close by the rushing water. A second later, with a clutch like iron, Salvarini was upon him.

'Ah!' he hissed, as they struggled to and fro, 'you thought to escape me, you murderer of

innocent women, the slayer of my wife! Now I have you. Back you go into the river, with a knife in your black heart!'

The doomed man never answered; breath was too precious for that. And so they struggled for a minute on the slimy pier, Salvarini's grip never relaxing, till, suddenly reaching down, he drew a knife. One dazzling flash, a muttered scream, and Le Gautier's lifeblood gushed out. Footsteps came down the stairs, a shrill shout from a woman's voice. Salvarini started. In one moment, Le Gautier had him in a dying clasp, and with a dull splash, they fell backwards into the rushing flood. Down, down, they went, the tenacious grip never relaxing, the water singing and hissing in their ears, filling their throats as they sucked it down, turning them dizzy, till they floated down the stream—dead!

Some boatmen out late, attracted by the scream, rowed to the spot; and far down below Blackfriars, they picked up the dead bodies, both locked together in the last clasp of death. They rowed back to the pier, and carried the two corpses to a place for the night, never heeding the woman who was following them.

Next morning, they saw a strange sight. Lying across the murdered man, her head upon his breast, a woman rested. They lifted her; but she was quite dead and cold, a smile upon her face now, wiping out all trace of care and suffering—a smile of happiness and deep content. Valerie had crept there unnoticed to her husband's side, and died of a broken heart.

For a few days people wondered and speculated over the strange tragedy, and then it was forgotten. A new singer, a noted poisoning case, something turned up, and distracted the frivolous public mind from the 'mysterious occurrence,' to use the jargon of the press.

Maxwell lost no time in getting to Grosvenor Square the following morning, where his greeting may be better imagined than described. He told Enid the whole story of his mission, omitting nothing that he thought might be of interest to her; and in his turn heard the story of Le Gautier's perfidy, and the narrow escape both had had from his schemes.

'I do not propose to stay any longer in London,' Sir Geoffrey said. 'After what we have all gone through, a little rest and quietness is absolutely necessary.—Enid, would you care to go down to Haversham?'

'Indeed, I should. Let us go at once. I am absolutely pining for a little fresh air again. The place must be looking lovely now.'

'All right, my dear,' the baronet replied gaily; sooth to say, not sorry to get back to a part of the world where Sir Geoffrey Charteris was some one.

'Then we will go to-morrow, and Maxwell shall join us.'

'But Isidore? I have not seen her yet.'

'Oh, she can come down there some time, directly we are settled.'

Later on in the same day, Maxwell heard the strange tale of Le Gautier's death. He did not tell the news to Enid then, preferring to wait till a time when her nerves were more steady, and she had recovered from the shock of the past few days. So they went down to

Haversham, and for three happy months remained there, 'the world forgetting, by the world forgot'; and at the end of that time, when the first warm flush of autumn touched the sloping woods, there was a quiet wedding at the little church under the hill.

Gradually, as time passed on, Sir Geoffrey recovered his usual flow of spirits, and was never known to have another 'manifestation.' He burned all his books touching on the supernatural, and gradually came to view his conduct in a humorous light. In the course of time, he settled down as a model country gentleman, learned on the subject of short-horns and top-dressing, and displaying a rooted aversion to spiritualism. It is whispered in the household—only it must not be mentioned—that he is getting stout, a state of things which, all things considered, is not to be regarded with incredulity.

Nearly two years later, and sitting about the lawn before the grand old house, were all our friends—Salvarini, mournful as usual, little altered since we saw him last; Maxwell, jolly and hearty, looking with an air of ill-disguised pride at Enid, who was sitting in a basket-chair, with a little wisp of humanity in her arms, a new Personage—to use the royal phrase—but by no means an unimportant one. Lucrece was there, happy and gay; and Isodore, glorious Isodore, unutterably lovely as she walked to and fro, followed by Salvarini's dog-like eyes. The baronet made up the party, and alas! truth must out, looking—but we will be charitable, and say portly.

'How long are you going to stay with us, Isodore?' Enid asked. She would always be Isodore to them.

'Really, I cannot say, Enid. How long will you have me?'

'As long as you like to stay,' Maxwell put in heartily.—'By the way, I suppose I am still a member of the League?'

'No, not now. Conditionally upon your promising never to reveal what you have seen and heard, you are free; Sir Geoffrey likewise.—Luigi here has resigned his membership.'

'I am so glad!' Enid cried. 'I must come and kiss you.—Fred, come and hold baby for a moment.'

'No, indeed'—with affected horror. 'I should drop him down, and break him, or carry him upside down, or some awful tragedy.'

'You are not fit to be the father of a beautiful boy; and everybody says he is the very image of you.'

'I was considered a good-looking man once,' said Maxwell with resignation. 'No matter. But if that small animal there is a bit like me, may I?'

They all laughed at this, being light-hearted and in the mood to laugh at anything. Presently, they divided into little groups, Isodore and Luigi together. All her cold self-possession was gone now; she looked a very woman, as she stood there nervously plucking the leaves from the rose in her hand.

'Isodore—Genevieve'—

At this word she trembled, knowing scarcely what. 'Yes, Luigi.'

'Five years ago, I stood by your side in the

hour of your trouble, and you said some words to me. Do you remember what they were?'

'Yes, Luigi.' The words came like a fluttering sigh.

'I claim that promise now. We are both free, heaven be praised! free as air, and no ties to bind us. Come!' He held out his arms, and she came shyly, shrinkingly, towards them.

'If you want me,' she said.

With one bound he was by her side, and drew her head down upon his breast. 'And you are happy now, Genevieve?'

'Yes, I am happy. How can I be otherwise, with a good man's honest love?—Carlo, my brother, would you could see me now!'

'It is what he always wished.—Let us go and tell the others.'

So, taking her simply by the hand, they wandered out from the deepness of the wood, side by side, from darkness and despair, from the years of treachery and deceit, out into the light of a world filled with bright sunshine and peaceful, everlasting love.

#### DIAMOND-SMUGGLING.

IN accordance with rules of concealment laid down by Edgar Allan Poe, some 'clever things' have of late years been done in the smuggling of precious stones into the United States of America, the philosophy which pervades Poe's story of the *Purloined Letter* having evidently been studied to some purpose by the professional diamond-smugglers, who are known to form a comparatively numerous body.

Poe's tale, the scene of which is laid in Paris, the characters introduced being of course French, contains what may be called a novel theory of 'hide-and-seek,' which, stated briefly, is, that the greater the importance of the article which has been stolen, the simpler should be its mode of concealment. On the assumption that an important state document, or criminatory letter involving serious consequences to some one, and the possession of which would enable another person to make use of its contents for his own benefit, has been purloined, the more conspicuous the place chosen to conceal it the better, till it can be made use of. Should the recovery of the stolen document be a matter of importance, which may be assumed, it will, of course, be carefully sought for, and those searching for it will no doubt pry with care into every secret hiding-place, with the hope of finding it; whilst—to put the case in a homely way—it is 'all the time staring them in the face,' those in search of it overlooking it because of their idea that, in consequence of its great importance, the utmost care will have been exercised in its concealment.

Much incidental and curiously instructive information is contained in Poe's *Purloined Letter* as to the modes of criminal search adopted in France, where magnifying-glasses of great power, and microscopes, play a part; where beds are dismantled and chairs are dis-jointed to see that what is wanted has not been concealed in some part of them; where libraries of books are turned over leaf by leaf, and picture-frames are tapped to see that they contain no foreign material. As Poe points out,



that is all in the way of routine, and is traditional among French criminal investigators in the matter of every-day crime. It requires a master-mind, however, to fathom the doings of a really well-educated thief who purloins an important document in order to hold it in terrorism over a political enemy or social foe.

So in the matter of diamond-smuggling. Artists—if we may profane the word—have come to the front, men far ahead of the original stereotyped smugglers, who were contented to carry on their business in old-fashioned ways; ever cudgelling their brains to find out modes of concealment so elaborate as to make sure they would be discovered. All the more extraordinary devices of concealment, as they were thought to be at the time, were one by one found out and battled with by the custom-house officers of the United States. Some of them were thought rather remarkable, as, for instance, those managed by means of artificial teeth—a set of these useful implements of mastication being fashioned in such a manner that every tooth possessed a cavity which contained one or more diamonds or other precious stones: the hole being deftly filled up with cement, discovery was thought impossible. By this ingenious mode of procedure, a large number of the rarer gems were at first smuggled into the States without paying duty (ten per cent. on diamonds), chiefly by means of female aid. Waxing bolder by long-continued immunity from any discovery of their fraud, the officers on duty began to wonder why the same ladies had so often occasion to cross the Atlantic; and one of their number surmising that it was 'for no good purpose,' determined to have a particular female carefully watched during the voyage. A stewardess with whom the officer had a friendly acquaintance was enlisted in the service; and this person did all she could to find out why the suspected ladies so frequently visited Europe, but to little purpose, as she thought, all she was able to discover being apparently not of much consequence. One day, however, whilst carefully examining the berth in which the traveller slept, she found a broken tooth, which was hollow and exceedingly fragile. As the stewardess used artificial teeth, she naturally enough felt interested in the matter, and spoke to the voyager about the circumstance. The lady at first looked embarrassed, but then said she had been cheated by the dentist. At the end of the voyage the stewardess reported the circumstance to the officer, who, after thinking it over, came to the conclusion that there was more in the affair of the hollow tooth than met the eye. New York, in fact, is celebrated for its dentistry; and on consulting one of the professors, the officer discovered that teeth of the sort had been made in quantity and from different moulds to the order of a very 'cute man, who said they were wanted to be sent to Europe. This statement afforded a sufficient cue; and accordingly, at the termination of the next voyage, two ladies, sisters, were respectfully but firmly requested to take out their artificial teeth. Remonstrance was unavailing; the teeth were made to disclose their hidden treasures; the result being that thirteen valuable brilliants were confiscated, much to the chagrin of the fair smugglers. That little episode put an end to that mode of smuggling diamonds.

There is a never-ending demand throughout the United States for these gems; and several of the earlier adventurers were known to have made money by means of the smuggling business. In reality, diamonds are a passion with many American ladies, who must have them, no matter what they may cost. These gem-loving dames, in their eagerness to 'trade' for jewels of all kinds, are not unfrequently cheated by persons who sell them 'bogus' diamonds, made of paste, at a comparatively cheap rate, under pretence of their being smuggled stones, and that, having escaped the payment of duty, they are a bargain at the sum demanded. Wealthy American ladies vie with each other at the various fashionable resorts of the United States in their displays of costly jewels and gems. It was stated a few months ago in an American paper that a rich man's wife wore upon her neck and breast every evening precious stones of the value of forty thousand pounds; other ladies displaying jewels to a lesser amount. Nor are American ladies free from the charge of smuggling; many of them, indeed, are adepts at the business, able to impart a secret or two to 'the professionals.' During a recent Saratoga season, one lady was heard to boast that she had brought over a suite of diamonds in the heels of several pairs of slippers which she had made on purpose to contain them. These dainty articles were ostentatiously displayed, and taken notice of by the searchers; but the heels were not suspected to be hollow or to contain diamonds. Hollow-heeled boots were at one time greatly in use as a part of the smuggling machinery. That mode of carrying on the illicit traffic was ultimately discovered by an under-steward of an American liner, who, for 'a consideration,' communicated the secret to the custom-house authorities. Then followed a series of contrivances in the shape of double-bottomed trunks, valises with secret pockets, desks with hidden drawers, and guns and pistols which were so contrived as to contain a few of the much-coveted gems. All these contrivances were in turn discovered: they were just the kind of concealments which the officers had their thoughts fixed upon. For a time, we believe, the professional diamond-carriers were discomfited; but their discomfiture was not for long; the business was too profitable to be easily relinquished, however great the risks might be.

Just as the customs' authorities were under the impression that they had suppressed the illicit traffic, a new era in gem-smuggling was inaugurated, and more diamonds reached the United States 'duty free' than before. Smuggling, it may be said, developed into a fine art; at all events, the incidence of the trade for a brief period became so simple as to seem like child's play; indeed, children were made to play an important part in the business. A story which lately became public shows how well the modern diamond-smugglers had laid to heart Poe's precepts. 'Please to hold my baby whilst my husband helps me to open my trunks; he will be quite good if you will shake his rattle,' said a lady passenger to the officer who was waiting to look over her travelling gear. And that officer good-humouredly did as he was requested, shaking the rattle, to the great delight of the little one. The rattle in question, which,

fastened to a ribbon, was tied to the child's waist, was filled with gems of great value, a mode of smuggling that at the time was too too simple for detection.

A clever female attired in the costume of a Sister of Mercy was passed over by the officers because she had no luggage worth examining. She possessed, however, a fine string of beads, which, with downcast eyes, she kept telling. Safe on land, she was affectionately welcomed by two persons dressed in costumes similar to her own. Need it be told that she was a smuggler, and that her beads were so constructed that each held a diamond weighing seven or eight carats. Another ingenious person hit upon the plan of placing a few precious stones in a toy kaleidoscope which had been given to a child, who carried it ashore in safety. A number of homing pigeons kept in cages, and purchased at a village in Belgium, and brought to the United States by way of Paris and Havre, also played a profitable part, each of the pigeons being freighted with a cargo of exquisite gems, concealed in quills, and carefully fastened to the message-bearing dove. An extensive system of diamond-smuggling was at one time carried on from Canadian ground by the aid of homing pigeons. The discovery of this illicit trade was made accidentally by a farmer, who happened to shoot one of the birds, and on examining it found that there was fastened to its leg a quill containing a number of diamonds! A clue being obtained, the local habitation of the pigeon proprietors was discovered and their mode of business put an end to. The scheme, stated simply, was to fly every week or ten days a flock of a dozen or fifteen pigeons, each carrying about half-a-dozen gems. As the duty on diamonds amounts to ten per cent., the trouble taken to smuggle these gems into the United States does not seem so very remarkable. The value of the precious stones honestly imported into the States is between eight and nine million dollars per annum, and it has been calculated that gems to half that sum escape payment of the duty.

Many tales have been circulated with regard to diamonds, some of them of a rather curious kind. We have read of faithful messengers who, rather than yield up the stone they carried, swallowed it. The owner of a slave who had done so, and who had been killed by robbers, was so convinced of his servant's fidelity, that he gave directions for the opening of the body, and found that the honest fellow had swallowed the precious gem. Dishonest servants employed at the diamond mines frequently display wonderful ingenuity in concealing stones which they have purloined while at their work. About a year ago, a rough diamond weighing four hundred and fifty-seven carats was stolen by a person in the employment of the Central Diamond Mining Company at Kimberley (South Africa), who sold it for the sum of three thousand pounds to four persons who dealt in stolen stones. It was then sold at Cape Town to a firm of illicit dealers in diamonds for nineteen thousand pounds; and was ultimately purchased for forty-five thousand pounds by a syndicate of London brokers in precious gems. The means by which this magnificent brilliant was smuggled from the mines and ultimately got to England was never made

known. It is notorious enough, however, that a large trade in fraudulently obtained stones is carried on at the South African gold-fields; and stories are told of buyers around the diamond mines who have made large fortunes by purchasing stones at nominal prices from labourers who possessed the cunning and the courage to successfully brave the authorities and bring to the resettlers their stolen goods.

It has been calculated by persons engaged in the business that twelve per cent. of the fall in the price of rough diamonds, which has taken place within the last few years, should be set down to the sale of stolen gems, which, to the value of more than half a million sterling, annually find their way to the markets. These stones are the direct fruits of theft, those selling them having made no contribution whatever to the cost of obtaining them. When first the work of diamond-seeking at Kimberley began, there were no thefts of any importance, because each man was then working for his own hand, or as one of a limited but friendly partnership. It was not till the work of diamond-mining required the aid of hired labour that the work of systematic robbery commenced, and 'I. D. B.' (illicit diamond buying) became an institution of the Diamond Fields. Many of the persons employed, soon fell into habits of speculation, not being able to withstand the temptation presented by the appearance of a little bit of stone that might be worth, perhaps, a thousand pounds, if they could succeed in carrying it away without being detected. In every branch of the process of gem-finding, valuable diamonds, it has to be explained, are always at the mercy of the men employed, some of whom are never slow to take advantage of any chance that may present itself of securing a stone. Such thefts during the last few years have proved a source of serious annoyance and trouble in connection with the industry. The 'I. D. B.' trade, as it is locally termed, has tended to sap the morality of the place, and given rise to the many evils which result from resetting. There is an old adage which says that 'if there were no resettlers, there would be no thieves.'

Great precautions are taken by the various diamond-digging Companies at Kimberley to prevent the theft of stones; whilst the crime of reset is always punished with much severity. A license to deal in rough diamonds costs a sum of fifty pounds per annum; and dealers, in addition to procuring this authority to trade, are required to find security to a large amount. Dealers are bound by the terms of their license to make exact entries in their books of every parcel of stones they purchase, and also how they dispose of them. Large diamonds must be described in detail and minutely. Should the detective department suspect any dealer of illicit traffic, that dealer may at any moment be visited, and have his books and stock overhauled and compared; and should he possess a few stones which he is unable to account for, he is liable to have his whole stock seized. Upon a late occasion, a friend of the writer's, while on a visit to the Kimberley Diamond Fields, was informed that two well-known diamond dealers had just been visited by the detectives; and one of these persons having about eight hundred carats, and the other about seventy carats, not accounted for in their books, the police seized

their stocks—upwards of ten thousand carats in all; and within one month from the date of the seizure, both dealers were tried, convicted, and sentenced; and if still alive, they are now working out their time on the breakwater at Cape Town. One of these men was reputed to be worth over a hundred and fifty thousand pounds. At the present time, there is quite a colony of convicted 'illicits,' as they are sometimes designated, working out their sentences on the harbour-works at Cape Town, a goodly proportion of the gang being worth large sums of money.

Although there is a considerable and clever detective staff on the Diamond Fields, there are those at Kimberley who can outwit the police, at anyrate for a time, and so it happens that such a number of stones is annually stolen as to prove a factor in disturbing the market price. The chances of detection are no doubt great; but the hope of securing a few hundred pounds by a little speculation is so tempting, that there are always hundreds of men at 'the game.' Some of the thieves—that is, the men who steal the stones they are paid for unearthing—display great ingenuity in carrying away the gems. The business of diamond-digging is naturally of a rough-and-ready kind, and presents opportunities for fraud which are not available in other industries. When diamond-stealing first became a business, those interested, suspecting no evil, were easily cheated. Stones were then carried away concealed about the person of the labourers. But, as the thefts increased, greater precautions were taken to insure the detection of the thieves. Some of the 'dodges' which have been resorted to in order to carry diamonds from the diggings have been not a little remarkable; we have only room, however, for a sample or two. Upon one occasion, it is related that an ingenious labourer wrapped the stones in a small piece of soft bread, the morsel being greedily snapped by a dog. The dog was carefully looked after till the mine was left behind, when it was ruthlessly killed, to obtain the hidden diamonds which were contained in its stomach. Domestic fowls have been trained to swallow the smaller stones, which have afterwards been cut out of their crops. A parcel of stolen gems has been known to have been got out of a well-watched digging by having been ingeniously fastened to the hair of a horse's tail!

Any individual suspected of being an 'I. D. B.' may expect, on leaving the Fields, to be overtaken on his road to the coast by detectives, who will search him in order to find if he be in possession of any stones. Many devices have been resorted to for the concealment of the diamonds. A Dutch Boer who had been for some time under suspicion, on leaving the Fields with his wagon was followed by some detectives who had determined to search him. Just before he was overtaken by the officers, he was seen to detach one of the bullocks from his team and deliberately shoot it. By the time the police came up the Boer was busy removing the hide. A thorough search was made by the detectives; but no gems were found. The phlegmatic Dutchman had placed the diamonds in the barrel of his gun, and had fired them into the body of his bullock, from which of course he had to extract them; and he did so as soon as the police turned their backs upon him.

The various modes of diamond-smuggling revealed in the foregoing narrative present no peculiar features of endurance or romance; but cases have occurred in which pain and suffering have played a part in the business of diamond-hiding. There is, for instance, the story of the magnificent gem which in its rough state formed the eye of an idol in a temple near Trichinopoly, and which was stolen by a Frenchman, who escaped with his prize to Persia, and who, fearful of being discovered, was glad to dispose of his ill-gotten gear for a sum of about two thousand pounds sterling. The man who bought the stone, a Jewish merchant, sold it to one Shafra, an astute Armenian, for twelve thousand pounds sterling. Shafra had conceived the idea that by carrying the stone to Russia, he would obtain from the Empress Catharine the Great a princely sum for it. How to travel in safety with the stone, the theft of which had of course been discovered and proclaimed, became a grave consideration. It was too large to swallow, and no mode of concealment presented itself to Shafra that seemed secure from discovery. The way in which he solved the problem was remarkable. He made a deep incision in the fleshy part of his left leg, in which he inserted the stone, closing the wound carefully by sewing it up with silver thread. When the wound healed, the Armenian merchant set out on his travels quite boldly, and although more than once apprehended, rigorously searched, and even tortured a little, he was obdurate, and firmly denied having the stone in his possession. Having at length reached his destination, he asked from the Empress the sum of forty thousand pounds for the gem, an amount of money which Catharine was unable to raise at the moment. We next find the Armenian at Amsterdam with the intention of having his diamond cut. Here the stone was seen by Count Orloff, who determined to purchase it for presentation to his royal mistress, the Empress Catharine. The sum ultimately paid for the gem was about seventy thousand sterling in cash, together with an annuity of five hundred pounds, and a patent of nobility. Shafra flourished exceedingly, and died a millionaire. Such, in brief, is the story of the Orloff Diamond.

## 'DOUBLEWORKS.'

### A STORY OF ATHLONE.

Who has not heard of the old historic town on the Shannon called Athlone, believed by its inhabitants to be the exact centre of Ireland; celebrated at one time—for it has been now some years removed—for the old bridge built in the reign of Queen Bess, whose arms and monogram, E. R., were engraved on a stone built into a kind of monument on the parapet. Celebrated also for its old church bell, bearing in relief the inscription—THIS: FOR: ST: MARY'S: CHVRCH: IN: ATHLONE: 1683—this being the identical bell which, at six o'clock in the afternoon of the 30th of June 1691, clanged the signal for the attack on the forces of King James, commanded by the French general, St Ruth, and holding the castle, &c., by the troops of the Prince of Orange



under Ginkell. The old house occupied by him as headquarters during the siege is still in existence, having the date of its erection, 1626, carved on the doorway. We might go on detailing many other things for which the old town is celebrated, but *cui bono*? Enough that it is celebrated in song as the residence of 'The Widow Malone, Ochoone!'

Often as we have been reminded of the existence of Athlone by hearing the above-mentioned humorous ditty trolled forth at mess by one of Ours, who, being a genuine son of the soil, was fully qualified to do it ample justice, it had never been our good fortune to cast eyes upon it until some forty years ago, when, one fine afternoon, we found ourselves, with some thousand or so other candidates for martial glory, marching gaily through the by no means sweet-smelling town, over the beautiful new bridge which spans the river, and under the walls of the ancient castle, to the merry strains of the *Lass o' Gowrie*. These forty years are a long time to look back upon; many a long march under foreign suns have we made with the old regiment, and in many a stirring scene and hard-fought field have we accompanied it since then; but somehow our memory recalls few things more vividly than the appearance of that long column of dusty, travel-stained men, who were finishing their hot day's march that summer afternoon, tramping along briskly and cheerily to the old familiar air of the regimental quick step.

We quickly settled down in our new quarters, and before long, had formed many pleasant acquaintances, all only too delighted to show us every civility in their power; and jolly nights at mess followed fishing and boating parties during the summer, while, as the days began to shorten, there was good hunting and shooting; and dinner-parties and dances were by no means unfrequent.

In most garrison towns in which we have been quartered in Ireland, there were generally one or two peculiar hangers-on loafing about the barracks, queer nondescript bipeds, ever ready to run messages all over the country, or carry a fishing-basket or a game-bag, who eked out a precarious existence by tips from the officers and others who employed them, and picking up odd meals at the different barrack-rooms of the men. Athlone was not singular in this respect; and you constantly met, shambling across the barrack square, at a kind of half-trot, or lurking in rear of the officers' quarters, an odd, half-witted, but quite harmless creature, who went by the curious appellation of 'Doubleworks.' Who gave him that name, or whence it was derived, we are unable to say; we only know that he answered to it, and we had it from the regiment in whose place we had come. There was a kind of sporting air about this poor creature; he always wore an old hunting-cap and a shooting-suit, evidently the gift of some former patron of far burlier proportions than the poor attenuated frame which

they now enveloped; and an ancient pair of Wellington boots, much down at heel, into which the ends of the trousers were shoved, completed the costume, which, however, was varied on hunting-days, when the hounds met in the square or neighbourhood of the barracks, when, in honour of the occasion, an aged and much stained, once scarlet hunting-coat took the place of the shooting-jacket.

Like the other hangers-on of the Athlone barracks, poor Doubleworks subsisted, as we have said, upon the benevolence of his military patrons and friends; but, unlike the others, he was possessed of an accomplishment, not an elegant one, perhaps, or suitable for very refined society, but nevertheless one that brought him by its performance many an odd sixpence or shilling—he could hunt the badger! or was supposed to give a truthful representation of the 'drawing' of the above-named quadruped by a canine foe. This performance was vocal, and commenced by a series of whines, growls, and impatient barkings, mingled with grunts and low savage yelps, which we believe were meant for cries of rage and defiance from the badger; these, after lasting with variations for some time, gradually increased in intensity, at length culminating in an unearthly din, perfectly indescribable, but which was stated by the 'fancy' and capable authorities to be quite true to nature. For ourselves, not having had experience in such matters, we are unable to offer a personal opinion, and can only observe that the din was marvellous as the production of a single pair of human lungs, and once heard was not likely to be ever forgotten.

His performance was not confined to any particular part of the barracks; it might be heard at any hour of the day in the artillery square, the cavalry square, the infantry square, or amongst the barracks occupied by the scientific arm of the service, the Royal Engineers; but it took place most frequently at the officer's guardroom; for in those days there used to be an officer's guardroom and an officer in it at the main barrack gate, which led directly from the infantry square into the market-place of the town. This guardroom was in the centre of a small block of buildings to the left of the gate as you went out, having on its right the regimental orderly-room, where the colonel administered justice every morning, and where the orderly-room clerks smoked strong tobacco, and filled in forms and sketched caricatures of regimental and other authorities every day. The men's guardroom adjoined that occupied by the officer, from which it, as well as the orderly-room, was separated by a partition wall, the end wall of the men's guardroom being next the street. In front of these rooms was a small veranda, and beyond this the guardroom sentry paced his 'lonely round.' We are thus particular in describing the locality, as it pleases us to recall it after so many years, because it will give our readers a better idea of what is to follow.

The guardroom—we mean the officer's—was in those days a kind of club or place of call for all officers going out of or coming in to barracks. It was considered incumbent on every passer-by to drop in on the officer of the guard and help him to while away the tedium of his confinement



by retailing any news there might be going; while he on his part provided alleviation for any thirst accruing from dry narration. By night, the guardroom was generally pretty full until a late hour. A recent order of the Duke of Wellington, then commander-in-chief, and which procured for him the cognomen of 'the Tobacco-stopper,' prohibited the use of tobacco in the precincts of the mess; and though this order was afterwards so far modified as to permit smoking in the anteroom, it was confined to cigars; so those who preferred the luxury of a pipe had either to indulge the propensity in their own rooms or seek the shelter of the guardroom. Needless to say, the latter alternative was the one most generally followed, and the hospitality of the subaltern on guard was accepted as freely as it was offered. Altogether, the main-guard was not a disagreeable place to spend twenty-four hours, especially if it rained, which it can do in those parts, and we ourselves preferred it to the duties of regimental orderly-officer.

One day in the mid-winter of 1846, it came to my turn to mount this guard. The weather had been unusually severe—it had been snowing for a day or two, and the ground was covered to the depth of several inches, while a smart frost had served to make the snow hard as a brick; so that, as I marched my guard across the square to where the old guard was drawn up, waiting our arrival, the men's tread made no more track than if we had been marching on the surface of the square itself. The preliminaries of relieving guard having been got over as quickly as possible, we paid the parting compliment to the old guard of presenting arms, as it moved off in slow time; and then dismissing our own, we visited the sentries, to ascertain if they had the orders of their respective posts correctly, and then gladly dived into our own den, and doffing our cloak, proceeded to make ourselves as comfortable in front of a huge peat-fire as it was possible to be, braced up in a high stiff stock and tightly fitting coatee and epaulets, as was then the regulation.

The day passed like most others on guard; but, owing to the weather, the passers-by were fewer, and our after-mess visitors didn't stay so late as usual; by eleven or half-past, all had taken their departure for their respective quarters; and about midnight we proceeded to go round the sentries. There was a bright moon, with a clear star-studded sky. It was not unpleasant walking over the hard frozen snow, and we were not long reaching the farthest-off and last of the sentries, who was posted at the hospital gate. Besides the usual orders, he had special directions to look after the dead-house, a small building situated close inside the hospital gate, to which the bodies of deceased men were conveyed until interment, and to allow no one to enter it unless passed in by the hospital-sergeant. The sentry, when giving up his orders, added that a man had died in the hospital late that evening, and that his corpse was now lying on the table in the dead-house. Accompanied by the corporal of the escort, we walked over to the window, and by the bright moonlight could see something extended on the table, as the man had said, covered with a sheet. After this, we came back across the square to the guardroom, and lighting

a pipe, were soon deeply interested in a book that we were reading. Gradually we began to nod, and the book to slip from our hand, and the grand-rounds having already visited the guard, and there being but little danger of having to turn it out again before the morning's reveille, we were about to go to sleep in earnest on the guardroom sofa, when we were startled from our semi-somnolent condition by hearing the loud challenge, 'Who goes there?' from the sentry who had been pacing up and down in front of the veranda. We could hear the rattle of his arms as he threw his firelock to the 'port,' and the rapid tread of some one running towards the guardroom and crunching the frozen snow. Presently the challenge was repeated in a quick peremptory tone, but, as in the former case, without obtaining any response; and then there came a kind of half-articulate gurgling cry, followed by the sound of a heavy fall, and the crash of arms and accoutrements, and the shout of, 'Sergeant of the Guard!'

Fearing that something bad had happened, we jumped up and dashed out of the guardroom, and saw lying on the snow, close to the sentry, who was standing at the 'charge,' the figure of a soldier clad in his greatcoat and fully accoutred, and a little way from him his firelock with fixed bayonet lying on the snow, as it had escaped from his grasp in falling. The sergeant and all the men of the guard had rushed out at the same time as we had, and were now engaged lifting the prostrate figure, who at the moment we feared had been run through by the sentry for not replying to the challenge, and trying to run past him. Such, however, happily was not the case; the sentry hadn't touched him, and said that the man had come rushing towards him from the far angle of the square, and instead of answering the challenge, had continued to approach, making the queer gurgling sound which we had heard, and falling as if shot when he came to where he now lay.

The sergeant of the guard now reported to me that the man was alive, though quite insensible and making a moaning noise, as if in a fit. He further stated that he was the sentry who had been posted at the gate of the hospital. We at once sent a man of the guard for one of the assistant-surgeons of the regiment whose quarters were close at hand, and had the insensible man carried into the guardroom and laid on the guard-bed, his stiff leather stock removed, coat, &c. unbuttoned, and water sprinkled on his face; but all, seemingly, to no purpose: he remained unconscious, and kept up the moaning noise, while now and then struggling hard with those about him. At last the doctor arrived; and having administered some restoratives, after a while the poor fellow became sensible, and sufficiently calm to inform us why he had committed the serious offence of deserting his post. He stated that he had continued to walk about on his beat at the hospital gate for some time after we had visited him, and that all was quiet, when suddenly sounds as if of chairs being upset and knocked about appeared to come from the dead-house; that he had gone up to the window, as we had a short time before, and looked in, and that he saw the corpse off the table, and standing up close inside the window,

and that it, as he said, 'jeered' at him; that this fearful sight had so unmanned him, that without more ado he had taken to his heels, and had no recollection of anything else that happened until he returned to consciousness on the guard-bed. He was evidently suffering from a terrible shock to his nervous system; and it was only with the greatest difficulty that, mingled with heavy sobs and shudderings, we could manage to get the poor fellow to speak: he was driven nearly demented by the ghastly sight which he was persuaded that he had witnessed.

As soon as he could be left with safety to the care of the guard, who were directed not to pester him with questions, the surgeon and I with a corporal and file of men set off for the hospital; and as we crossed the square, strange noises began to reach us, the growling, snarling, and other sounds of canine conflict mingling with the unmistakable howls with which Doubleworks interlarded his performance.

'Hillo!' we said to the doctor; 'do you hear that? What an hour for Doubleworks to be hunting the badger; we thought he was never allowed in barracks after tattoo.'

As we neared the hospital, the badger hunt, which had ceased for a few moments, broke out afresh, this time mingled with shouts of wild unearthly laughter, and proceeding unmistakably from the dead-house, in which the corpse of the dead soldier had been deposited. We roused up the hospital sergeant, who, good quiet man, snored serenely through it all, and got from him the key and a lantern, and opening the door, found that with the dead man the wretched Doubleworks had been locked up. How he got there unnoticed, no one could tell; he had not been observed by any one about the place; and the only conclusion that we could arrive at was, that he had slipped in when the body was being placed on the table, and had ensconced himself behind the door until it was pulled to and locked upon him.

However true this theory might have been, there was no means of verifying now, for, from whatever cause arising, it was but too evident that poor Doubleworks had become quite insane. He had removed the sheet from the body of the dead man, which lay there in its solemn stiffness before us, in strange contrast to the mad pranks of the lunatic, who, having, no doubt, wrapped himself in the sheet, had presented himself so disguised to the sentry, when he looked in at the window, thereby almost driving him as mad as he was himself.

Why he didn't favour us with a similar exhibition when we went to look in at the window, we can't imagine; perhaps he may have objected to the presence of more than one spectator, for he must have heard the steps of the corporal and file of men who were with us when going our rounds. At anyrate, he made no objection to leaving the dead-house now, though he seemed in no way in dread of the other occupant of it. He was next day made over to the civil authorities, and was afterwards transferred, we heard, to the district lunatic asylum; and what was his subsequent fate, we do not know. The sentry he had so horribly frightened, after several weeks in hospital, returned to his duty; but we don't think he ever quite got over the shock,

and he was discharged from the service within a twelvemonth after. Perhaps he may be still alive, and if so, we will bet a trifle he has not forgotten Doubleworks.

### RUSSIAN PETROLEUM.

MR CHARLES MARVIN, who has already done much to familiarise English readers with the Russian petroleum industry and the extraordinarily prolific nature of the oil-wells at Baku, on the Caspian, has again returned to the subject in a pamphlet entitled *The Coming Deluge of Russian Petroleum* (Anderson & Co., Cockspur Street, London). As these wells, when transport facilities are more perfect, may seriously affect the home and American oil-trade, the facts brought out in Mr Marvin's pamphlet are worthy of attention.

We learn that of the five hundred petroleum wells at Baku, the majority are situated on the Balakhani Plateau, eight or nine miles to the north of the town. The latest 'sponter' of Tagieff's is, however, in a different locality, being situated on a promontory three miles to the south of Baku. Here Gospodin Tagieff began boring about three years ago. At first, the oil was slow to come, and at its best had never yielded more than sixteen thousand gallons a day. On the 27th September last, having touched oil at seven hundred and fourteen feet, the well began to spout oil with extraordinary force. 'From the town, the fountain had the appearance of a colossal pillar of smoke, from the crest of which clouds of oil-sand detached themselves and floated away a great distance without touching the ground. Owing to the prevalence of southerly winds, the oil was blown in the direction of Bailoff Point, covering hill and dale with sand and petroleum, and drenching the houses of Bailoff, a mile and a half away. Nothing could be done to stop the outflow.' It seems that the whole district was covered with oil, the outflow being at the rate of thousands of tuns a day, which filled up cavities, formed a lake, and on the fifth day began to escape into the sea. The square in front of the town-hall of Baku was drenched with petroleum. On the eighth day, the outflow reached the highest ever known—a rate of eleven thousand tuns, or two and three-quarter million gallons a day. 'Thus,' says Mr Marvin, 'from a single orifice ten inches wide there spouted daily more oil than was being produced throughout the whole world, including therein the twenty-five thousand wells of America, the thousands of wells in Galicia, Roumania, Burmah, and other countries, and the shale-oil distilleries of Scotland and New South Wales.' By the fifteenth day, those in charge had got the outflow so far under control as to restrict it to one quarter million gallons a day. It was certainly a misfortune that of the ten million gallons of oil ejected from Tagieff's well, most of it was at first lost for want of storage accommodation.

The yield of oil at Baku is thus much ahead of the greatest product of the American wells. Nobel Brothers' No. 18 Well has yielded, from a depth of seventeen hundred and twenty-one feet, nearly thirty million gallons of oil; and

their No. 9 Well, from a depth of six hundred and forty-two feet, forty million gallons. Some of these wells are kept closed while oil is being sold at so cheap a rate. Against the assertion that the product of these wells may dry up and will not last very long, Mr Marvin says that there is ample historical evidence that petroleum has been flowing from the Apscheron peninsula for two thousand five hundred years, and that there seems more likelihood of the American wells drying up than those of Baku. Besides, the petroleum region of the Black Sea has scarcely been touched, and there the oil seems as plentiful as in America.

Owing to this prodigious outflow without a ready market, oil was selling there, in the beginning of October last, at *one penny per sixteen gallons*. The best refined petroleum or lamp-oil is sold at three-farthings a gallon. The production of crude petroleum last year exceeded four hundred and twenty million gallons; there are now one hundred and twenty firms with oil-refineries at Baku, which last year turned out one hundred and twenty million gallons of refined petroleum. The production in 1878 was only one and a quarter million gallons. The bulk-system of transport, as distinguished from carrying in barrels, first adopted in 1879, has had a tendency to revolutionise the trade, and now there are one hundred oil steamers on the Caspian. Some of these steamers have a capacity of carrying eight hundred tons of oil each trip.

After extracting thirty per cent. of lamp-oil, and allowing ten per cent. for waste and dregs, the remaining sixty per cent., out of every hundred gallons, is used for lubricating and other purposes. Large quantities are imported by certain firms in London, for the manufacture of lubricating oils. Although thus exported, the supply of this waste or residue is so great that it has become the principal fuel in South-east Russia. Steamers purchase it at Baku at fourpence a tun, to be used as fuel. When sent by rail to Batoum, the price rises as high as one pound per tun, which is still cheaper than English coal. More than two hundred and fifty tank and many passenger steamers and locomotives now use this waste oil as fuel in place of coal. A tun of liquid fuel is said to do the work of two or three tons of coal: the chief advantage of its use consists in the fact that it can be turned off and on like gas; it is clean, and takes up very little bunker-space, a matter of great importance to steamers travelling to long distances. The Black Sea Steam Navigation Company, owning seventy-six steamers, intend to commence using this oil-refuse.

The chief outlets for the transport of Baku oil at present are by the Volga and the Transcaucasian Railway. A concession has been granted by the Russian government for laying down a petroleum pipe six hundred miles long for the carrying of the oil from Baku to a point on the Black Sea. The pipe must be large enough to carry one hundred and sixty millions of gallons of oil a year; and it is expected that three years will elapse before it is in working order. Meantime, the North Caucasus Railway will be completed in 1887, and it is expected that it will convey at least one hundred million gallons of oil to the port of Novorossisk, on the Black Sea.

Thence it can be shipped in tank steamers to Europe.

We learn that a huge iron reservoir is being built at a remote spot in the outer harbour of Amsterdam for the storage of petroleum. It will be nearly thirty-three feet in diameter, and of the same depth, and is calculated to hold nearly one million seven hundred and forty thousand gallons. The petroleum will be brought direct from Russia in these tank steamers, and will be pumped out at Amsterdam into the tanks, thus saving the expense of filling and emptying casks, besides diminishing the risks of accidents.

Mr Marvin is of opinion that the world is consuming more oil yearly, and he calculates the daily consumption at two million gallons. Along with the cheapening of the oil have also come great improvements in the make of lamps, such as the Defries Safety-lamp, in which the receptacle for the oil is formed of brass. Mr Marvin makes the sensible suggestion, that as Russia is flooding the surrounding countries with oil, our manufacturers might supply the south-east of Europe with lamps, and thousands of cooking and warming stoves. It appears that there is not a country in Europe to which Baku oil is not now shipped, and the figures quoted show that American petroleum is being driven from the Black Sea and the Mediterranean. Mr Marvin is of opinion that the shale-oil industry of Scotland already shows signs of yielding to the competition of America, 'and unless special circumstances should arise, must eventually be crushed by the rivalry of Russian petroleum, when imported in bulk.' And apparently he has written his pamphlet in order to rouse British ship-owners, manufacturers, and capitalists to secure a share in the expansion and development of the Baku oil-trade.

[We have on more than one occasion advocated the use of oil in calming *broken* billows at sea, and thus saving a ship or boat which otherwise might succumb to the fury of the storm. Might it not, therefore, be worth while to make further experiments in the abandonment of costly coal, and fit up steamers with this comparatively cheap material, which, while driving the ship, might in a heavy seaway save her, if the oil be allowed to ooze from bags made fast to windward? The use of oil at sea during rough weather *cannot* be overestimated.—Ed.]

#### TOBACCO-CULTURE IN SCOTLAND.

It is quite right for agriculturists to do what is possible in the direction of introducing new kinds of crop that may possibly turn out remunerative; and in this view, some interest is attached to recent experiments in the culture of tobacco. If the North Americans can compete with British farmers in the production of good beef and mutton, Britain may possibly maintain the equilibrium by cultivating the weed of which the New World has long had a monopoly. Potatoes were introduced into this country from America, and have proved to be a rich benefit. It is just possible that tobacco also may turn out to be a not less lucrative gift to the producer. More than a hundred years have elapsed since a trial was made in Scotland, principally, but not exclusively, in the south-eastern counties. It failed



at that time, through the combined influences of a bad season, the interference of the government—believed to be at the instance of Glasgow merchants—and ultimately of a rapid fall in the price of imported tobacco, a combination of circumstances not likely to occur again.

Of the trial made towards the close of last century, a detailed account has been left on record by the Rev. Dr Somerville of Jedburgh. In consequence of the war with America, tobacco had continued to rise in price, till, in 1781, it reached the unprecedented price of two shillings the pound. Dr Jackson, a gentleman who possessed a small estate near Kelso, had for two years previous laid out a few acres in the culture of tobacco, the science of which he had learned from long experience in America. In 1781, his whole crop had been sold at the extraordinary rate of two shillings and sixpence a pound. His example and reputed success led others to follow in the same line. Even the minister of Jedburgh had five acres of his glebe laid out as a tobacco plantation; and his statement is that, in 1782, many thousands of acres in the counties of Roxburgh, Berwick, and Selkirk were planted with tobacco, nearly every farmer in these counties having devoted some considerable part of his arable land to this adventurous speculation. In Berwickshire, complaints were made that many acres of the best land were occupied with tobacco instead of being cropped with grain.

The year 1782 is notable as having been one of the most inclement seasons either in the eighteenth century or the present. Snow, which had fallen plentifully during the winter, remained so long on the ground that the sowing of grain was delayed at least a month after the ordinary time. The summer was uncommonly wet and cold; the harvest was so late that even in early districts corn was not cut down till October, while a great part of it was reaped only in November; and much of it in the higher grounds never ripened at all. Tobacco, like other crops, suffered from the cold rainy season; and its destruction was completed in the month of August by a thunderstorm of unusual violence, accompanied with a great fall of hail. The succulent leaves were riddled; many of the most luxuriant plants were destroyed; and the prospects of speculative farmers were seriously blighted.

The discomfiture of tobacco-planters, begun by the unpropitious season, was completed through the interference of Glasgow merchants. The tobacco trade in that city had gradually grown to large dimensions. It had begun in a small way soon after the union with England in 1707. At first, Glasgow merchants had no ships of their own, but were dependent on English vessels; and not till 1718 did the first Glasgow ship cross the Atlantic. Gradually the tobacco trade of Glasgow increased, till it roused the jealousy of merchants in London, Liverpool, Bristol, and Whitehaven, who made strenuous but unsuccessful efforts to crush those enterprising Scottish traders. The traffic continued to flourish till in 1775 there were fifty-seven thousand one hundred and forty-three hogsheads of tobacco imported from Virginia, Maryland, and Carolina. At the instance of these Glasgow merchants, the government officials came to understand that the revenue would suffer if tobacco grown in Scotland were

carried free of duty into England. Accordingly, an Act was passed in 1782 permitting the use and removal of tobacco, the growth of Scotland, into England for a limited time under certain restrictions; but liable to duties similar to those due and payable on the importation of such tobacco, the growth and produce of the British colonies or plantations in America.

By a subsequent Act, provision was made for granting relief to the proprietors of such tobacco, in consideration of the inferior quality thereof, or any accident or defect that may happen in the growth or culture of the crop so as to render the same not marketable or worth the duties imposed thereupon. For this purpose, it was enacted that the Commissioners of Customs at Edinburgh might allow, and order to be paid to the owner or proprietor of such tobacco, out of any revenue under their management which is applicable to the payment of incidents, at the rate of fourpence for every pound-weight thereof, for which the owner or proprietor thereof shall refuse to pay the full duties imposed by the said recited Act, provided the commodity shall be given up and burned, the owners being compensated at the rate of fourpence a pound. Even at that moderate figure, it was said that thirteen acres in the parish of Crailing brought one hundred and four pounds sterling, or about eight pounds an acre. The return would have been three times as much, but for the Act of Parliament which fixed the rate of compensation so low. Altogether, the county of Roxburgh was believed to have lost fifteen hundred pounds by the arrangement. The experiment was not renewed in 1783, one reason for which is doubtless indicated in the announcement made on the 21st of March that year, that 'tobacco has fallen fourpence a pound this week.'

The more recent experiments of growing tobacco near Kelso were, we understand, quite successful so far as plant-production of a good quality was concerned, but excise difficulties prevented the utilisation of the crop. It only remains for us to assure our readers that a tobacco plant, grown in a pot, is a pretty household ornament.

## THE MONTH:

### SCIENCE AND ARTS.

THE Japanese sanitarium, Kusatsu, possesses such important remedial properties that it is believed that when its reputation becomes more widely known in Western countries, patients will flock to it from all parts of the globe. Here, in the volcanic soil, are a series of natural baths of different temperatures, the waters of which are charged with sulphur, arsenic, copper, alumina, magnesia, in various proportions. To these baths come the halt, the maim, and even those who are as far blind as that too common disease ophthalmia can make them. They bathe here in waters which are described as caustic and evil-smelling, some of which consist of little else than dilute sulphuric acid. This treatment, owing to the great temperature and searching action of the different chemicals dissolved in the water, is often most agonising to the patients,



who can only bear it for several minutes at a time. But its efficacy in various species of disease is said to be most thorough, even incurable maladies being mitigated by these wonderful waters.

The *Builder* calls attention to the careless construction of flues and party-walls in houses, which constitutes a common cause of houses being burned down. The evil is best described by showing what occurred at a private house in London not many weeks ago. A smell of fire was detected, luckily in the daytime, when people were about and able to seek the cause. Upon examination of a certain flue, it was found that ties of fir covered with lead passed on each side of it. These ties had ignited, and had communicated their fire to a library bookcase. Although the Building Act forbids this mode of construction, there are many houses which were built before it became law, and doubtless a large proportion of them have wood in dangerous proximity to their flues. Although at the time of building, such woodwork may have been partially protected, the modern method of sweeping a chimney is apt to knock off projections and to move bricks out of place, thereby giving a ready means of access to fire.

At a recent meeting of the Academy of Sciences, Paris, a paper was read by M. Pasteur on his Treatment of Hydrophobia. As Pasteur's work has recently been much criticised, sometimes not too kindly, it may be as well briefly to state the results which he has recorded after inoculating nearly 2500 patients. Of these, 80 were English, 52 Austrians, 9 Germans, 107 Spaniards, 10 Greeks, 14 Dutch, 165 Italians, 25 Portuguese, 191 Russians, 1726 French and Algerians, and 54 of other nationalities. Confining his remarks to the French cases, as being, we presume, those only the subsequent history of which could be followed, M. Pasteur said that out of the large number stated, the inoculation had proved ineffectual in ten cases only. Six of these ten were children, and one a woman seventy years old. As a result of studying these failures, M. Pasteur came to the conclusion that for deep wounds his treatment was insufficient. He has now modified it by making the action more rapid and energetic for all cases, and he considers that this alteration has already been productive of very favourable results.

A Russian doctor says that he has successfully treated with cantharides some patients who were bitten by a rabid wolf. Three men were badly bitten by the animal in various parts of the body, and cantharides plasters were applied to the wounds. At the same time, powdered cantharides was administered to each in doses of one grain each day, until certain well-known symptoms were exhibited. These patients have now been in perfect health for eight months since the bites were given, and it is hoped that cantharides has thus proved a successful remedy to the dire disease with which they were threatened.

A petroleum engine has been invented by Herr Siegfried Marcus of Vienna, and adopted by the German government as a motor for torpedo boats. It is said to be far more powerful than a steam-engine of equal bulk, while its fuel takes up much less space than coal.

The engine is said to work well and without any risk of explosion.

We are always glad to note anything new in the way of utilising waste products, for such saving represents a distinct gain to the country. The last item of this kind that has been recorded is a method, which has been patented, of making use of spent dye liquors for the manufacture of writing-ink. The spent liquor of bichromate of potash, or soda, such as may have been used for mordanting wool, &c., is boiled with the waste logwood liquor from dyeing-vats. The result, after certain additions have been made, is a non-corrosive and permanent ink.

A successful attempt has recently been made, near Liverpool, to acclimatise a beautiful variety of carp called the 'Golden Orfe,' a fish which comes from Bavaria. The ornamental gold-fish which are commonly seen in aquaria in our own country will not, as a rule, breed here, and if they do, their descendants are black rather than golden. But these Bavarian fish, while quite as beautiful, will breed freely, and their young will retain the colour of the parents. The fish is about one foot in length, and is said to attain a weight of six pounds. It will be valued by anglers for the reason that it will rise to a fly in waters which are inclosed, so that by its help fly-fishing may be still further enjoyed in landlocked waters. Some ponds near Liverpool have been stocked with this hopeful fish; and if present anticipations are realised, its culture will no doubt be taken up in other parts of the country.

The experimental crop of tobacco grown at Sydenham, close by the Crystal Palace, by Messrs Carter & Co., has, so far as cultivation and preparation for market are concerned, proved a decided success. The experiment shows that the fragrant weed can be produced and prepared by hands unused to the work, in an uncertain climate such as ours. The total crop raised by Messrs Carter covered only three-quarters of an acre of ground, and its estimated weight is about fifteen hundredweight, having a market value of forty-two pounds, or at the rate of fifty-six pounds per acre. This estimate is of course the value of the raw material free of all duty. The operations involved in tobacco-growing are such as could be undertaken by small cultivators, and it remains to be seen whether the government will allow this new kind of farming to be tried on a more extensive scale. Their decision should come quickly, so that farmers may have time to prepare their ground for the new crop.

A new method of preserving polyzoa and other low forms of life has been discovered by Dr A. Föttinger. Crystals of chloral hydrate are dropped into the vessel of water in which polypes have been placed, and in a short time the creatures become insensible, when they can be placed in alcohol. The advantage claimed for this method is that the polypes will remain expanded, and can therefore be preserved when exhibiting all their beauty of structure. The chloral acts, it would seem, in much the same manner as it affects higher organisms—that is, as a narcotic.

The extended use of the electric light in America seems to be by no means an unmixed blessing. It is said that in every town over a certain size the Companies are stringing their

wires over the streets to the danger of the inhabitants. But this danger does not arise from the risk of broken wires, so much as from wires which are so imperfectly insulated that the electric energy can escape to neighbouring telephone and telegraph lines. This is especially the case in storms, when the wires are awayed to and fro in the wind, and are often knocked together. The result of this is often a fire at the telephone or telegraph offices, sometimes leading to loss of life. It is said by telephone operators that it is not an uncommon thing to find, upon opening the office in the morning, that a telephone has been burned up during the night, its charred remains having fallen on the floor. It is evident that such accidents are preventable; but special legislation may be necessary to compel the Companies to adopt proper precautions against their occurrence.

Last month, we noticed certain improvements which have been made in the Electric Safety-lamp invented by Mr Swan of Newcastle. Another lamp of the same type has been contrived by Mr Miles Settle of Bolton. Mr Settle's lamp is an incandescent electric globe which floats in another glass globe of water. Should the glass, from any cause, break, the electric connection is broken too, and the lamp goes out. It is made in two sizes—one for main roads, and one for ordinary use. It gives a brilliant light, and is adapted for use in powder-magazines as well as in mines. Mr Settle is also the inventor of a water-cartridge which can be exploded in a fiery mine, or in one charged with coal-dust, without any fear of the surrounding medium catching fire. Both inventions have lately been subjected to experiments, which clearly prove their efficiency.

In view of the wonderful advances which have been recently made in the field of astronomical photography, it has been proposed by the Paris Academy of Sciences that an International Conference shall be held in the spring for the purpose of making arrangements for obtaining a complete chart of the heavens. This photographic map would be combined from many hundreds of photographs taken at ten or more observations in different parts of the globe. We shall have occasion again to refer to this important and deeply interesting subject.

It has long been admitted that if Britain is to retain her commercial position among the nations of the world, her workmen must have the advantages of technical education. Much has been done in this direction in recent years, but much more remains to be done. It would be as well if the various Institutes throughout the country were to follow the lead of the Finsbury Technical College, London. Here, a course of lectures on Electric Bells has been so well attended that it will shortly be repeated. Another course on Electro Deposition of Metals, with special reference to Nickel Plating, has been commenced. Following this will come the subject of Solders and Soldering. The intelligent working-man comes to these lectures, for he knows that he must learn something more than his father was master of, and that 'rule of thumb' must in these days give place to something more definite.

It is to be hoped that the conduct of an official at Bedford in deliberately handing to the public analyst a sample of beer which had been purposely

doctored with a poisonous drug, with a view to showing that customary analysis would not discover the addition, will not lead the unthinking to assume that chemical analysis is valueless. In examining a sample of beer, the analyst looks only for such ingredients as are liable to be used for its sophistication, such as sugar, added water, &c. In examining bread in like manner, he would look for alum or potato; in coffee, for chicory; and so on. But it would be quite outside his province to look for a mineral poison, unless he were told beforehand that the presence of such a poison was suspected. If it were the duty of the public analyst to search every sample of food submitted to him for all the poisons known to the world, each analysis would be an affair of many weeks, and his work would practically come to a stand-still.

At the beginning of the year, a certain number of the new Enfield-Martini rifles were issued to our troops, and several adverse reports concerning their efficiency were the result. The weapons were returned to headquarters, and have now been reissued to Portsmouth, Aldershot, and the School of Musketry at Hythe. Those into whose hands they are placed are required to answer several questions as to the efficiency of various parts of the weapon, and general observations upon its merits or demerits are invited. It is thought in many quarters that it is now time that a magazine or repeating rifle should become the arm of the infantry. But it has long become the fashion for Britain not to lead, but to follow the lead of other countries in these matters. The plan has the advantage of benefiting by the experience of others, but it can be carried too far.

It was recently pointed out in an article which appeared in the *Times* how little we are indebted to native talent for the more deadly and exceptional implements of war. The Gatling, Gardner, Hotchkiss, and Maxim machine guns are due to American ingenuity, and the practical conception of the turret ship comes from the same source. Nordenfelt with his machine gun and his submarine boat is a Norwegian. But what will prove perhaps the most deadly thing of all is the dynamite cruiser, which is about to be built for the American navy. This is a boat two hundred and thirty feet in length, with engines which will insure a speed of twenty knots. She is to be built of steel, and furnished with twin screws. Her armament is to consist of three guns, seventy feet in length, to fire dynamite shells, propelled by compressed air. This form of gun was invented and tried with success some months ago, and at the time we described its construction as being similar to that of a pea-shooter. The cartridge of the gun is a copper drum containing two hundred pounds of dynamite, and its flight of two or three miles through the air is rendered steady by the attachment of a wooden shaft, which acts towards it as a stick does to a rocket. It is certain that no ship afloat could withstand the explosion of such a terrible projectile.

The Germans have found a new use for Professor Hughes's microphone in the detection of leaks in water-mains. The apparatus required consists of a steel rod, in addition to the microphone, telephone, and battery. The rod is placed upon the stopcock in the neighbourhood of which a leak is suspected; and by listening to the telephone placed in circuit with it and the microphone,

the slightest leakage is detected. If the stopcock is a good one and there is no leak, no sound is heard; but the least leakage causes a vibration, which is rendered audible by the microphone. The operation is so simple that it is readily acquired by unskilled hands.

As Mr Watts, the eminent Academician, has announced his intention of bequeathing his valuable paintings to the nation, more than ordinary interest must centre round the nine pictures which he has sent to the Kensington Museum as what he calls 'samples' of his work. These include several of his more recent productions. We may mention, too, that the collection of fifty-five pictures by the same hand, which for some months have been exhibited in Birmingham, is now removed to the Museum galleries at Nottingham Castle. Mr Watts' works will thus be rendered familiar to many thousands of people.

We hear of a very ingenious and valuable improvement upon the construction of the steam-engine, for which various patents have recently been issued. This invention, which hails from the Dunfermline Foundry Company, N.B., consists of a steam-valve of entirely original design, which can be moved with the greatest ease, as there is no steam-pressure on any of its working parts, causing considerable friction, as in the case of the slide-valve at present in use. Apart from the simplification of the steam-engine, where quick stoppage and reversing are important considerations, its great value lies in the certainty of its preventing various kinds of accidents of a mortal character. Thus, where miners are being hoisted to the pit-mouth, there is always a danger that the engineman may lose control of the stopping arrangements, and a case of 'overwinding' is the result. The new valve, however, is so easily stopped, that the 'indicator' can be adjusted, so that when the cage reaches the platform at the pit-mouth, the steam is instantly cut off and overwinding rendered impossible. At sea, also, this valve will be most valuable, as the most powerful engines can be stopped and reversed with the greatest ease, and this cannot be said of the engines of the present day. The same remarks apply to locomotives. The valve has also been adapted to steam-winch, and here another advantage presents itself, inasmuch as, should the winch be stopped while the load is upon the chain, the load remains suspended without the application of a brake; in other words, the winch does not run away, because the 'exhaust' steam does not leave the cylinder, but is inclosed as a steam-brake, keeping the piston immovable.

In the neighbourhood of the mining village of Broxburn, about twelve miles west of Edinburgh, are several large shale oil-works. In making a new bore in connection with one of these works lately, a petroleum spring was struck at one hundred and fifteen fathoms from the surface. In driving a mine at a later date, petroleum was observed coming out of the rocks. In a deep bore made in 1884 the same appearances of petroleum oozing from the rock were observed. It was the discovery of a petroleum spring at Alfreton, Derbyshire, by the late James Young, which set him thinking and experimenting, and led up to his famous discovery of the distillation of oil from

shale. In Scotland, this industry has flourished in recent years, the annual output of shale for this having reached the enormous quantity of two million tons.

## OCCASIONAL NOTES.

### MILK-DIET FOR INFANTS.

IN an article on 'Infant-feeding,' contributed to the *Lancet*, Dr E. Paget Thurstan, M.D., publishes an interesting discovery that he has recently made. It has been very generally admitted that, inasmuch as salivary and pancreatic secretions are practically absent in newborn children, all farinaceous food should be avoided in their dietary. Dr Thurstan's discovery entails a departure from the letter, if not the spirit, of this axiom of child-rearing. Mothers are well aware that very young children cannot drink pure cow's milk, because it curdles in a lump in their stomachs. Certain chemical substances—notably lime-water—must be blended with the liquid to make it digestible. These auxiliaries, however, frequently produce sickness; and it is obviously undesirable to doctor a child with medicine for months together if it be not absolutely necessary. Some persons imagine they solve the problem by using condensed milk as infant-food. But Dr Thurstan points out that, though its curd is undoubtedly more digestible than that of uncondensed milk, the cane-sugar with which it is prepared, itself produces indigestion in a new form, while the condensation robs the liquid of much of its saline constituents, and removes material required for bone-formation. Hence he sought a new method of making cow's milk digestible to young children; and his final solution of the question is as simple as he declares it to be efficacious. He mixes with the milk a small quantity of farinaceous food, to secure a mechanical as opposed to a nutritive action. The particles of solid intermingle with the curds as they form, and thus prevent their coalescing into one large mass. Dr Thurstan suggests as appropriate agents the crust of bread—when free from alum and large quantities of potato starch—or any one of the many well-known infants' foods. He points out that they should be added to the milk in such small quantities and in such minute particles that it will easily pass through the tube of a feeding-bottle. Dr Thurstan mentions in detail the case of a weak and ailing child whose life was saved by this method of feeding.

### WOOD-PULP.

A report comes from Norway of a discovery just made at the Sognedal Pulp Factory, after years of experimenting—that wood-pulp can be used for the manufacture of all kinds of building ornaments which are usually made in plaster of Paris, the pulp readily taking painting or gilding to great advantage. The material also seems to be remarkably tough, and not easily broken, as shown by the fact that a bar a foot long, an inch thick, and five inches wide, was thrown with great violence against a wall and sustained no injury. Pieces have also been dropped from great heights with the same

result. The material is lighter than plaster of Paris, is impervious to wet, and therefore admirably adapted for ceilings, ceiling ornaments, friezes, and such-like, both outdoor and indoor. It can easily be fixed either with nails or screws. One more advantage is claimed by the inventor—that ornaments made from this material cost half the price of similar ones made of plaster. If this discovery is really all that it is said to be, it will prove a useful adjunct to all kinds of ornamentation and architectural decoration, and ought therefore to be specially acceptable in the building trade.

#### M. DEPREZ' ELECTRICAL EXPERIMENTS.

A series of interesting experiments have been lately carried on by M. Deprez at Creil, at the sole expense of Messrs Rothschild, with the view to ascertain whether certain results can be obtained from one generator and one receptor. M. Deprez now finds that with these appliances he can transmit to a distance of thirty-five miles a force of fifty-two horse-power, and that the machinery is now working regularly and continuously. The maximum electro-motive force is 6290 volts, which is all the more remarkable; for before the construction of M. Deprez' apparatus, the maximum force did not exceed 2000. The transmitting wires may be left uncovered on poles, so long as they are high enough to be out of the reach of the hand. The cost of this arrangement to provide a circular line of seventy miles, for a fifty-horse power of transmission, is estimated at five thousand pounds; not a high price, when all the circumstances are considered; and a cost that would be lessened if the machines were to be frequently manufactured or brought into general use, which is much to be desired, as a new and very practicable motor-power will thus be made available for industrial purposes.

#### SWEET DAY OF DAYS.

On the moss-grown bridge I stand,  
Where you gave me once your hand,  
Where a story, new, yet old,  
Once without a word was told.  
Still the daylight slowly dies,  
Ebbing from the tender skies;  
Still the river creeps along,  
Grooning yet its wistful song.

Day of days, sweet day of days,  
Years their shadows round us raise;  
Happy they who, looking on,  
Still remember days ago!

Ah! of all sweet days that day,  
Gone from sight and reach away,  
Even as this flower I throw  
Down the old gray stream will go.  
Nay—it lingers—prisoned lies,  
Where the swaying willows rise,  
Out of reach, love, like sweet days  
Lingering yet in memory's gaze!

Day of days, sweet day of days,  
Years their shadows round us raise;  
Happy they who, looking on,  
Still remember days ago!

G. CLIFTON BINGHAM.

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